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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/745,509	11/12/96	FELD	M MIT-6186Z

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33M1/0314

EXAMINER

SMITH, R

ART UNIT

PAPER NUMBER

3305

DATE MAILED: 03/14/97

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

☒ Responsive to communication(s) filed on 11/12/96 (preliminary amendment)

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 15-20 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 15-20 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on 11/12/96 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of Reference Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

The drawings are objected to because the in figure 1, box 80 should be labeled visible light source. FPA 140 is not seen in figure 4 as disclosed. Reference numeral 330 shown in figure 4 is not referred to in the specification. Correction is required.

The disclosure is objected to because of the following informalities: The specification is replete with typographical and grammatical errors. The following is merely an example of such. On page 2, line 31, "this" should be "This". This type of error is presented throughout the specification and applicant is requested to carefully review the specification and correct these problems. On page 3, line 21, "range" is misspelled. On page 4, line 20, "reliable" should be "reliably". On page 4, line 30, "and" should be inserted before "Raman". On page 4, line 33, "PFA" should be "FPA". On page 5, line 1, "tissue" is misspelled. On page 5, line 33, "raman" should be "Raman". On page 6, line 7, "fiber" is misspelled. The sentence beginning on page 6, line 23 is confusing. On page 8, the brief description of figure 1 refers to more than one system. On page 8, lines 8,11, "embodiment" is misspelled. On page 11, lines 6-7 reference to a visible light endoscope 80 is confusing. On page 13, line 11, "the" should be inserted before "spectrally". On page 13, line 28, "Fiber" should be "fiber" and on line 30, "Flush" should be "flush". On page 13, line 33, "of" should be inserted before "laser". The description of figure 4 is confusing in that the FPA 140 is not seen in the figure as disclosed. On page 14, lines 16 and 17, "cooled" and "coolant" are misspelled. On page 15, the PCT no. cited appears to be incorrect. On page 15, line 16, "are disclosed" should be inserted after "infrared". Reference to any of the figures should be amended such that, for example, Figure 6 on page 18, line 3 is "Figures 6a-c". Appropriate correction is required.

Claims 15-20 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. Claim 15 is incomplete in that the preamble set forth that the invention is directed to a Raman endoscope, however the body of the claim fails to set forth any structure related to Raman scattering. Claim 15 is vague and indefinite in that it is unclear as to what structure is defined by the memory. Claim 16 is incomplete in that it fails to positively set forth a connection between the additional optical fiber and the structure previously set forth. Claim 17 is incomplete in that it fails to positively set forth any connection between the broadband light source and the visible image.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an enabling disclosure.

Claims 15-19 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. An acousto-optical filter or equivalent filter means critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Applicant fails to disclose how the system would properly operate without the use of a filter positioned to receive the light reflected from the body before it passes to the FPA sensor.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the


invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-17,19,20 are rejected under 35 U.S.C. § 103 as being unpatentable over Alfano et al (5,293,872) in view of Lewis et al and Ito or Nagasaki et al. Alfano et al disclose the basic teaching of using a Raman endoscope as a diagnostic tool in examining tissue in vivo. Alfano et al discloses the use of a Nd:YAG laser to excite the tissue. Alfano et al also disclose the use of a broad band light source in order to provide a visible image of the tissue. Lewis et al disclose a spectroscopic imaging device that includes an acousto-optic tunable filter and a focal plane array detector. The invention of Lewis et al relates to non-invasively collecting images at multiple discrete wavelengths in the visible, infrared or near-infrared region. The device of Lewis et al is applicable to biological materials. Lewis et al disclose forming a plurality of images at different infrared wavelengths as seen in column 12. Lewis et al specifically refers to the use of the spectroscopic imaging device in a microscope but states in column 16 that the invention can be applied to other traditional absorption or emission spectroscopic approaches. Therefore, it would have been obvious to one skilled in the art to have modified Alfano et al such that the detector used is a focal plane array for the advantages disclosed by Lewis et al such as improved spectral and spatial resolution. Furthermore, it should be noted that it is a well known expedient in the art to place the imaging device at the distal end of the endoscope rather than using an optical fiber to transmit the detected radiation to an image sensor. Examples of such is shown in Ito and Nagasaki et al. Ito and Nagasaki et al also disclose the use of a filter in front of the image sensor to filter out undesired wavelengths. It would have been obvious to one skilled in the art to have further modified Alfano et al such that the focal plane array sensor is placed at the distal end of the endoscope. The advantage of such is to prevent the quality of pictures from deteriorating due to the breaking of optical fibers.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alfano et al (5,293,872) in view of Lewis et al and Ito or Nagasaki et al as applied to claim 15 above, and further in view of Sekiguchi. Sekiguchi discloses an endoscope that provides both a visible image and an image that provide information regarding tissue properties. The images are displayed simultaneously by a processing unit. Therefore, the system provides means for comparing the images. It would have been obvious to one skilled in the art that the images displayed by Alfano et al are simultaneously displayed such that they can be compared. Such comparison provides a more enhanced diagnostic evaluation tool.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ruth S. Smith whose telephone number is (703) 308-3063.

Facsimile transmissions should be directed to (703) 308-0131.

  
**RUTH S. SMITH**  
**PRIMARY EXAMINER**  
**ART UNIT 3305**

RSS  
March 9, 1997